

PATENT SPECIFICATION

DRAWINGS ATTACHED

1.102.676

1.102.676



Date of Application and filing Complete Specification: Oct. 7, 1966.

No. 44990/66.

Application made in United States of America (No. 494054) on Oct. 8, 1965.

Application made in United States of America (No. 579810) on Sept. 16, 1966.

Complete Specification Published: Feb. 7, 1968.

© Crown Copyright 1968.

Index at acceptance: —A1 M11; F2 V(E1C1, F2D, F7A1, M6X)

Int. Cl.: —A 01 k 39/02

COMPLETE SPECIFICATION

Apparatus for Supplying Water to Fowls

We, H. W. HART MFG. CO., a corporation organized and existing under the laws of the State of California, United States of America, of 914, Justin, Glendale, California, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to apparatus for supplying drinking water to fowls from the time the birds are newly hatched through a period of growth to full maturity. More particularly, the invention is directed to the need by large scale commercial poultrymen for such apparatus that meets the changing conditions encountered during the growth period of the fowls and does so effectively with minimum attention and servicing.

A drinking water apparatus for this comprehensive purpose must be based on a number of considerations. From the time that the chicks are first hatched, they must have full access to drinking water but throughout the whole growth period there must be no possibility of contamination of the drinking water by prolonged immersion of food particles with consequent bacteria action. The water must be close to floor level for access by the baby chicks but the baby chicks must not get wet. Because the environment should be dry and because moistening the droppings on the floor results in the breeding of flies, the water must not spill from the apparatus. A further important reason for this is that if water wastage is completely eliminated it becomes economical to give medication, for example expensive oral vaccine, to the baby chicks by adding the medication to the water supply. Such a medication procedure results in substantial saving in labour.

It has been found that the use of small drinking cups may be relied upon to keep the water contained at all times with no splashing onto the chicks or onto the floor and it has been further found that with only shallow water in the cups, young birds old enough to carry food particles to the cups will remove the food particles from the cups before bacteria action becomes a problem. Watering cups for this purpose may be provided with valves controlled by trigger members that are operated by pecking by the birds. Watering cups of this type are disclosed in U.S. patent 2,845,046.

Merely incorporating such drinking cups into a drinking water system, however, fails to solve all the problems that must be met to keep down the mortality of the chicks. Commercial poultry raising is highly competitive and with baby chicks costing from twenty cents to fifty cents each, in the United States, the mortality rate is a critical factor.

A basic difficulty arises from the fact that baby chicks are normally de-beaked on the first day to prevent cannibalism, both the upper and lower beaks being cut short. A newly truncated beak is so sensitive that the baby chick is not capable of pecking a valve-controlling trigger with operating force even if the chick has sufficient strength to do so. Consequently the water in a conventional cup is not replenished and the consequent dehydration of baby chicks may cause a drastic rise in the mortality rate.

With the passage of time, the truncated beaks become less sensitive and eventually some of the growing chicks learn to peck the triggers of the cups to obtain water. Unfortunately, however, relatively high pecking force is required to operate the trigger members of a conventional drinking cup and only a small percentage of the young birds ever

learn the technique. With six or more young birds depending on one bird to operate the trigger, even when the birds are mature, some birds will get insufficient water and if anything happens to the one bird, the others may be lost by dehydration. It is highly desirable, therefore to raise the fowls in some manner that will cause all or nearly all of the birds to learn to obtain drinking water at will be simply pecking a valve-controlling trigger.

The present invention meets this need by providing apparatus for supplying water to fowls comprising a water supply line, a cup and a valve for controlling the flow of water from the line to the cup and a pivotally mounted operating lever responsive to pecking force to open the valve against the force exerted thereon by the pressure of water in the supply line, the lever being buoyant in water but sufficiently long to be operable to open the valve by very young fowls.

The valve trigger action may be graduated in accord with the rate of increase of the strength and pecking ability of the growing birds. For the newly hatched chicks, a buoyant lever is substituted for the usual trigger to control the cap valve and to provide automatic water replenishment with no need whatsoever for cooperation by the chicks. To start the process of learning to peck a trigger, the buoyant lever or float member is shaped like a trigger and is capable of functioning like a trigger when it is pecked by a chick. When the chick's beaks become less sensitive, the water pressure may be raised sufficiently to require slightly more operating force than can be afforded by the weight of the float member. Consequently water in the cup may drop without the valve opening. Water replenishment then requires pecking action but the float member retains a few drops of water to encourage the chick to touch the float and only an exceedingly light touch is required to lower the float for water replenishment. Once the float is depressed in this manner it stays down until its buoyancy causes it to respond to the rising water level in the cup. Under these conditions where only light pecking force is required to start the water flow and a relatively large amount of replenishing flow results from a single peck, the growing birds are induced to peck for water replenishment and no bird suffers from want of water.

The next step to promote the training of the fowls may consist simply of raising the water pressure slightly to cause the valve to close promptly after the float member is pecked. The float member is thereby caused to function strictly as a trigger but a highly sensitive trigger. As the fowls mature and a high percentage learn to peck for water, a less sensitive trigger action is needed and the final stage is entered by raising the water

pressure still higher and substituting a conventional valve-controlling trigger for the float member, the transition by the fowls to this final stage being natural and free from complications.

To complete the solution to the overall problem, suitable safeguards are required to keep the water in the cups from becoming contaminated by the droppings from the birds. Preferably therefore a suitable guard is provided to keep the young birds from perching on the cups and on the adjacent conduit of the water system. Provision may be made for progressively raising the level of the drinking cups relative to the floor in step with the growing size of the bird.

The chicks may be transferred to a succession of living spaces, a first living space being equipped with low level drinking cups operated by float members for fully automatic water replenishment, a second living space being equipped with higher level cups under slightly higher water pressure for semi-automatic action by the float members, the third living space being equipped with still higher level cups and the water pressure being raised to cause the float members to act strictly as relatively sensitive triggers, the fourth and final living space having cups at a still higher level equipped with conventional triggers of substantially less sensitivity. If desired the second stage or the third stage may be omitted and in some instances both the second and third stage may be omitted.

In the preferred practice of the invention, however, the water system is sufficiently versatile to provide all four of the stages in the same living space. For this purpose the water system incorporates three provisions: first, adjustable water pressure; second, adjustable cup height; and, third, interchangeable float members and trigger members.

An improved cup can be used that is not only economical to fabricate, but also incorporates new and useful features. For economy of fabrication, the cup itself and the nipple for connecting the cup to the water system are moulded of a suitable plastic in one piece and the working parts are simple parts designed for easy assembly without the need of special tools or the need for special processing. Among the features are the design of the float members and trigger members for interchangeability without any possibility of a member accidentally dismantled by a peck by a bird. A brass valve seat can be coated with PTFE for use with an elastomeric valve member that does not contain a copper inhibitor. The cup can have a forward drip vane. In some installations for mature fowls, the drinking cups are placed above the front edge of a feed trough and if any water reaches the outer surface of the cup and drains from the outer surface, the vane diverts the drip-

ping water forward clear of the underlying trough.

The invention will be described in more detail, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 is a fragmentary perspective view showing a drinking cup connected to a conduit of a watering system;

Fig. 2 is a plan view of the same cup showing the cup equipped with a float member for valve control;

Fig. 3 is a sectional view taken as indicated by the line 3—3 of Fig. 2 to show the working parts of the valve mechanism;

Fig. 4 is a greatly enlarged fragment of Fig. 3 showing how a brass valve-seat member may be coated with PTFE;

Fig. 5 is an exploded view showing some of the parts that enter into the assembly of the cup mechanism;

Fig. 6 is a fragmentary sectional view similar to Fig. 3 showing how a trigger member may be substituted for the float member;

Fig. 7 is a diagram showing the forces involved in the operation of a float member;

Fig. 8 is a diagrammatic elevational view showing a simplified watering system with provision for varying the pressure of the water and provision for varying the height of the watering cups;

Fig. 9 is a diagram of a similar system with a different provision for varying the water pressure;

Fig. 10 is a plan view of another drinking cup apparatus embodying the invention;

Fig. 11 is a partly diagrammatic and partly sectional view with the section taken as indicated by the line 2—2 of Fig. 10 to show the working parts of the control mechanism;

Fig. 12 is a side elevation of a removable section of the buoyant float shown in Figs. 10 and 11;

Fig. 13 is a plan view of the removable section; and

Fig. 14 is a sectional view showing how the removable section may be disengaged from the other or base section.

Referring to the drawings, Figs. 1, 2 and 3 show a portion of a conduit 10 of a water system which is preferably made of a suitable plastic and which has an outlet fitting 12 bonded thereto with an internal screw thread for connection to a drinking cup 14. Preferably, but not necessarily, the drinking cup 14 is a moulded plastic body with an integral nipple 15 that screws into the outlet fitting 12. The nipple 15 provides a passage 16 through which water may flow from the conduit under control of a valve mechanism that extends through the passage.

The end of the plastic nipple 15 may form a convex conical valve seat for cooperation with an elastomeric valve member 18, but preferably such a valve seat is formed by a conical enlargement 20 of a ferrule or bush-

ing 22 that is mounted in the outer end of the passage 16. The elastomeric valve member 18 is cup-shaped for cooperation with the convex valve seat and is mounted on an enlargement 24 of a pin 25 that is slidingly mounted in the ferrule 22 with sufficient clearance for adequate water flow through the ferrule. Fixedly mounted on the pin 25 by a forced fit, is a plunger 26 which serves in effect as an extension of the pin for moving the valve member 18 to open position in opposition to the water pressure in the conduit. The plunger 26 which is formed with a rounded nose for actuation by a suitable control member fits slidingly in the passage 16 with clearance for water flow.

In Figs. 1, 2 and 3 the control member is a buoyant lever or float member, generally designated by numeral 28, provided in accordance with the invention and in Fig. 6 the control member is a trigger member 30 that operates in the manner of the prior art.

The ferrule 22 together with the pin 25 and the plunger 26 may be made of brass and the elastomeric valve member 18 may contain a copper inhibitor in a well known manner to prevent chemical interaction with the brass. If, however, the elastomeric valve member 18 contains a copper inhibitor and is used with a valve seat that is formed by the end of a plastic nipple, the copper inhibitor will cause the plastic valve seat to deteriorate by chemical action. This problem can be solved by omitting the copper inhibitor and, instead, coating the valve seat for enlargement 20 of the ferrule 22 with a thin layer of PTFE, such a layer or coating being indicated at 32 in Fig. 4.

For the purpose of mounting the two control members interchangeably, the cup 14 is provided with a transverse pin 34 which spans the interior of the cup and serves as a pivot means. In the construction shown two opposite walls of the cup 14 are formed with downwardly extending grooves 35 which are recessed at their lower ends to provide seats for the opposite ends of the transverse pin 34. The plastic walls of the cup are sufficiently flexible to permit the walls to be spread apart slightly for assembly of the transverse pin to the cup.

The control member 28 shown in Figs. 1, 2 and 3 is a float member that under certain conditions functions solely as a float and under certain other conditions is capable of functioning purely as a trigger. As indicated in Fig. 3 the float member 28 is formed with an angular slot 36 to receive the transverse pin 34, the slot having an entrance of slightly smaller width than the diameter of the pin to permit the float member to be forced onto the pin with a snap action. Once the float member is mounted on the transverse pin the restricted entrance to the angular slot opposes any upward movement of the float

member relative to the pin and the float member seats firmly on the pin.

At the closed position of the valve member 18 shown in Fig. 3, the plunger 26 is held at its rearward position by the pressure of the water against the valve member 18 and at this position the plunger holds the float member up as shown with the operating arm 38 of the float member spaced above the bottom of the cup. Any force that tends to rotate the float member 38 counterclockwise as viewed in Fig. 3 is limited by the rocking of a pair of spaced bosses 40 of the float member against the inner surface of the cup, and, on the other hand clockwise rotation of the float member is limited by movement of the operating arm 38 against the bottom wall of the cup. Downward movement of the operating arm 38 toward the bottom wall of the cup retracts the valve member 18 from the valve seat 20 to permit water to flow from the conduit 10 through the passage 16 into the cup 14. In the event that any moisture reaches the exterior surface of the cup in such amount as to cause drainage, the shape in profile of the cup as seen in Fig. 3 directs the drainage towards the front of the cup where the cup is formed with a downwardly extending drip vane 42. Thus any dripping that may occur from the cup for any anomalous reason will miss an underlying feed trough that is set back slightly from the front end of the cup.

The float member 28 is made of a plastic which is of sufficiently low specific gravity to be buoyant in water and for this purpose the float member may be made of polypropylene. Thus if the arm 38 is immersed in water, the arm tends to swing upward and thus permit water pressure to force the valve member 18 to closed position. It is to be noted that the control arm 38 forms a shallow receptacle 44 which traps a small quantity of the water and thus induces thirsty birds to touch the float member.

The trigger member 30 shown in Fig. 6 is similar in construction to the float member 38 and has a shorter operating arm 45 that is incapable of functioning as a float. The operating arm 45 forms a shallow receptacle 46 to retain a small quantity of water to encourage fowls to peck the trigger member.

Fig. 8 shows diagrammatically a water system wherein a tank 48 is suspended by an overhead cable 50 that passes over a pair of pulleys 52 and carries a suitable counterweight 54, the counterweight serving to maintain the reservoir tank at whatever level it may be placed. A hose 55 from a suitable water source keeps the tank 48 filled under the control of a valve 56 that is operated by a float 58. A conduit structure, generally designated 60, equipped with distributed drinking cups 14 of the construction hereto-

fore described is supplied with water from the tank 48 by means of a flexible hose 62. For supplying water to newly hatched chicks, the conduit structure 60 may rest on the floor 64.

The conduit structure 60 is provided with suitable anti-perch means to keep the birds from perching on the inner ends of the cups 14 and on adjacent portions of the conduit structure. The anti-perch means may comprise what may be termed a spider, generally designated 65, having downwardly divergent wire legs 66 that are connected to the conduit structure at sufficiently low angles to interfere with birds that have perching tendencies. The spider 65 is adapted to serve as means for suspending the conduit structure 60 adjustably through a range of levels above the floor 64. For this purpose the spider 65 is suspended from a cable 68 which passes over pulleys 70 and carries a suitable counterweight 72 that maintains the conduit structure at any level to which it may be adjusted.

Fig. 7 shows diagrammatically the forces which affect a control member, the control member in this instance being the float member 28. The arrow P-1 represents the force exerted by the plunger 26 in response to the pressure of water against the valve member 18. The arrow P-2 represents the force of gravity acting on the operating arm 38 in a direction to tend to retract the plunger 26 for opening the valve. Finally, the arrow P-3 represents the buoyancy or the upward force on the operating arm 38 that is created by the displacement of water by the operating arm. Since the material of the float member 28 is of lower specific gravity than water, the buoyancy force P-3 always exceeds the gravity force P-2 when the control arm is immersed in water. It is apparent that the buoyancy force P-3 permits the water pressure represented by force P-1 to close the valve whereas the gravity force P-2 tends to open the valve in opposition to the water pressure.

If, for what may be termed the first stage of operation, the water pressure that creates the force P-1 is less than a head of fifteen inches, say a head of between ten and fifteen inches, the gravity force P-2 opens the valve in opposition to the force P-1 whenever the water level falls below the operating arm 38. On the other hand, when the operating arm 38 becomes submerged the buoyancy force P-3 dominates to swing the operating arm upward and thus permit the water pressure to close the valve. In this manner and under these conditions the float member 28 functions solely as a float for automatic water replenishment to maintain a given level of water in the cup without any cooperation whatsoever on the part of the newly hatched chicks. During this first stage of operation, the conduit structure 60 may rest directly on

the floor 64 and the reservoir tank 48 is lowered to provide the required head of less than fifteen inches. In practice it is a simple matter to ascertain empirically the correct level of the reservoir tank 48 at which the float member 28 functions solely as a float for automatic water replenishment.

For the second stage of operation after the chicks are started on their growth, the conduit structure 60 may be lifted slightly clear of the floor and the reservoir tank 48 may be adjusted in height to create what may be termed a critical head of at least fifteen inches, at which head the gravity force P-2 is not adequate to overcome the force P-1 to open the valve when the valve is closed but is adequate to keep the valve open once the valve is open. Under such conditions the water in the drinking cup will drop progressively as it is consumed and the water may drop until the operating arm 38 is entirely above water level. Sooner or later, however, the water trapped in the receptacle 44 that is formed by the operating arm 38 will attract a thirsty chick and the resultant contact of the chick's beak against the operating arm will open the valve in opposition to the water pressure and thus permit the operating arm 38 to drop. Thereafter water is admitted to the cup by the open valve until the water level rises sufficiently to cause the buoyancy force P-3 to overcome the gravity force P-2 to cause the operating arm 38 to swing upwardly and thereby permit the water pressure to cause the valve to close. In this manner the baby chicks come to associate pecking of the control arm 38 with flow of new water.

For the third stage of operation, the conduit structure 60 is again raised slightly in accord with the growing height of the fowls and the reservoir tank 48 is adjusted upward to provide a head slightly above the critical head, say a head of seventeen to eighteen inches at which the gravity force P-2 created by the operating arm 38 is insufficient to open the valve in opposition to the pressure of the water represented by force P-1. Under these conditions the valve opens only when a pecking force is applied to the operating arm 38 and the valve closes promptly after the momentary force is applied. Early in this third stage the water may at times drop to a low level in the drinking cup but sooner or later a fowl will be attracted to the receptacle 44 that is formed by the operating arm and will thereby lean that pecking the operating arm results in flow of fresh water. Later in the stage it is found that so many birds have learned the pecking technique that the water level remains high.

For the fourth and final stage, the non-buoyant trigger member 30 is substituted for the float member 28 as shown in Fig. 6.

In addition the water head is increased, say to five or six feet to require a strong pecking force for water flow.

In the modified water system that is shown diagrammatically in Fig. 9, the usual conduit structure 60 equipped with drinking cups 14 is supplied by a flexible hose 74 from a standpipe 75. The upper end of the standpipe 75 is connected to an upper stationary tank 76 which is supplied with water by a pipe 78 under the control of a valve 80 which is governed by a float 82. A second lower fixed tank 84 is supplied with water through a valve 86 that is controlled by a float 88. A third still lower tank 89 has a valve 90 controlled by a float 91. Finally a lowest tank 92 is supplied through a valve 93 controlled by a float 94.

A cutoff valve 100 in a pipe 102 controls flow from the lowest tank 92 to the conduit structure 60; a cut-off valve 104 in a pipe 105 controls flow from the next higher tank 89 to the conduit structure 60; a cutoff valve 106 in a pipe 108 controls flow from the next higher tank 84 to the conduit structure 60; and, finally, a cutoff valve 110 in the standpipe 75 controls flow from the highest tank 76 to the conduit structure 60. The cutoff valve 100 is opened and the other cutoff valves are closed for the first stage of operation; the cutoff valve 104 is opened and the other cutoff valves are closed for the second stage of operation; the cutoff valve 106 is opened and the other cutoff valves are closed for the third stage of operation; and, finally, the cutoff valve 110 is opened and the other cutoff valves are closed for the fourth stage of operation.

One disadvantage of the embodiments of Figs. 1 to 9 described above is the necessity of repeatedly varying the water head. Another disadvantage is that the differences in heads is relatively small and critical.

Another disadvantage of these embodiments is that providing a pressure in the water system equivalent to a head as low as ten to fifteen inches introduces undesirable complications in the structure of the system. In many installations, for example, there are two or more tiers of cages for the fowls and if the water pressure must be controlled within close limits, the different levels of the cages must have different water feed lines. If one line is employed to supply two tiers the water pressure will either be too high for the lowest tier or too low for the highest tier.

Another disadvantage resides in the fact that the water pressure in the system is relied upon to keep the valves of the water cups closed when the water level in the cups is high. In any installation where a number of water cups are connected to a single supply line, the static pressure is relatively high when no cups are drawing water from the system

but if several cups are drawing water simultaneously the pressure in the feed line drops drastically. Thus if the normal static water head is between ten and fifteen inches which is high enough to keep the valves tightly closed when the level in the cups is sufficiently high the pressure in the water line may periodically drop substantially below ten inches at some of the cups with consequent leakage of water through the valves to cause overflow of the cups.

The embodiment of the invention which will now be discussed meets all the problems involved in this situation by providing a water system which operates at a moderately high water head as distinguished from a relatively low head of ten to fifteen inches and uses the same moderate pressure both for supplying water to newly hatched fowls and for supplying water to young fowls that are several days old. Preferably, this embodiment of the invention employs a water head of forty to forty-two inches and simply varies the characteristics of the trigger mechanisms in the cups to provide highly sensitive initial trigger action for newly hatched fowls and to change over to trigger action of substantially less sensitivity for older growing fowls. The static pressure head of forty to forty-two inches is so far above the low range of ten to fifteen inches that the pressure in the supply line does not drop to below the low range even when a large number of cup valves are opened simultaneously. The moderate pressure head of forty to forty-two inches is also high enough to supply more than one tier of cages.

To carry out this concept, we initially provide a buoyant trigger or float arm in each drinking cup that is highly sensitive to pecking forces because it is sufficiently long to provide advantageous leverage. To teach the baby fowls to peck the trigger for water, the trigger occupies a substantial portion of the area in plan of the interior of the cup to result in a high probability that random pecks will encounter the trigger. After about two weeks the sensitivity of the trigger mechanism is reduced simply by lessening the length of the buoyant trigger to such degree that the weight of the trigger alone cannot overcome the prevailing water pressure. At the moderately high pressure of forty to forty-two inches, a short buoyant trigger acts in the same manner as a conventional non-buoyant trigger in that it responds only to a peck of substantial force and will close promptly to avoid wastage of water.

Turning now to this embodiment of the invention illustrated by Figs. 10 to 14, Figs. 10 and 11 show a watering cup, the construction of which is largely similar to the first described construction shown in Figs. 1, 2 and 3 as indicated by the use of corres-

ponding numerals to indicate corresponding parts.

Fig. 11 shows diagrammatically how a pipe indicated by a dotted line 115 may connect the supply conduit 10 to an overhead tank 116 that is kept filled with water under the control of a valve 118 that is operated by a float 120. It is apparent that the normal static head of water in the system is the distance H in Fig. 11 which is the difference between the level of the water in the overhead tank 116 and the level of the valve mechanism of a drinking cup that is connected to the conduit 10.

If none of the drinking cups is drawing water from the system the static head H will be in effect but several of the drinking cup valves may be opened simultaneously to cause a substantial drop in the pressure at a drinking cup. Thus in practice the hydraulic pressure that tends to keep the valves closed fluctuates over a given range below the magnitude of the head H. If the minimum pressure in this given range of fluctuation is less than the pressure necessary to keep a drinking cup valve firmly closed, there will be times when the valve will leak to admit excess water to the drinking cup. It has been noted in some installations that the minimum water pressure to prevent such leakage is a head of between ten and fifteen inches. Therefore the head H in Fig. 11 must be sufficiently above ten to fifteen inches to insure that the minimum pressure in the given range of fluctuation is not substantially lower than fifteen inches. It has been found that in a typical watering system of the character described wherein a large number of distributed watering cups are supplied by a single conduit, satisfactory operation is provided if the head H is forty to forty-two inches.

For the purpose of supplying water to newly hatched fowls, the weight of the float or trigger 28 will be sufficient for the trigger to open the valve in opposition to the head H and at the same time the trigger will be sufficiently buoyant to permit the valve to close when the water level in the cup rises to a predetermined minimum level. By virtue of the buoyancy and length of the trigger, the trigger will be highly sensitive to respond to exceedingly light pecking forces. The area in plan of the buoyant trigger 28 can be a substantial portion of the area in plan of the interior of the drinking cup to result in a high probability that a random peck by a baby fowl into the interior of the cup will encounter the trigger to teach the baby fowl that the trigger will respond to pecks.

After a period of about two weeks in which the baby fowls grow and gain strength, the weight, extent and area of the trigger 28 is drastically reduced to lower the sensitivity of the trigger to such a degree that only a forceful well-aimed peck will operate

the trigger to admit water into the cup. The reduction in sensitivity of the trigger, may, of course be accomplished by substituting one trigger for another but in the preferred practice of the invention the conversion is carried out by simply removing an outer end portion of the trigger. In this regard a feature of the present embodiment of the invention is that the trigger 28 is made in two separable sections, one section being a base section 122 that is operatively connected to the valve, the other section being a removable extension section 124 that is releasably connected to the base section.

As shown in Fig. 11, the base section 122 of the trigger 28 is recessed to form an upwardly facing seat 125 with the inner end of the seat forming an upwardly directed shoulder 126 and with a portion of the material of the base section overhanging the seat to form a downwardly directed shoulder 128. As shown in Fig. 11, the extension section 124 of the trigger 28 normally rests at its inner end in the seat 125 of the base section 122, the extension section hooking under the downward shoulder 128 and fulcruming on the base section. The extension section is formed with a small lug section 130 that engages the upward shoulder 126.

The shape and dimensions of the two trigger sections 122 and 124 and the inherent resiliency of the plastic material are such that the extension section may be engaged and disengaged with the base section with snap action. Thus the lug portion 130 of the extension section 124 snaps into engagement with the upward shoulder 126, the lug portion and upward shoulder being cooperating parts of the two sections that function as a detent for releasably maintaining the extension section in engagement with the base section.

As best shown in Fig. 12 the extension section 124 is formed with an inner end portion 132 that is shaped and dimensioned for snug fit in the seat 125 of the base section 122. Fig. 14 shows how the extension section 124 may be swung upward relative to the section 122 for the purpose of releasing the extension section from the base section. The extension section may be again engaged with the base section whenever desired by an obvious manipulation which involves initially positioning the extension section relative to the base section in the manner indicated in Fig. 14.

For initial use with newly hatched baby fowls, the extension section 124 is assembled to the base section 122 to make a two-part trigger 28 that functions as a float for automatically maintaining a given minimum level of water in the watering cup. The two-part trigger 28 is highly sensitive to impact forces because of the relatively long length of the lever arm and, as may be seen in Fig. 1 the

two-part trigger extends over such a large portion of the interior of the drinking cup that if a baby fowl makes a random peck into the interior of the cup it is highly probable that the random peck will encounter the trigger to teach the baby fowl that the trigger is responsive to pecks.

When the baby fowls are approximately two weeks old, it is a simple matter to remove the extension sections 124 from the triggers 28 of all of the cups to make the triggers less sensitive. The pressure in the water line is sufficiently high to keep the valves of the drinking cups closed with the shortened triggers 28 of the drinking cups elevated, the shortened triggers being non-responsive to changes in water level in the drinking cups. Thus a well aimed and relatively forceful peck is required to actuate a shortened and lightened trigger 28 for the admission of water into a drinking cup. When the shortened trigger is pecked by a fowl it opens to admit water but immediately closes. Water is admitted to the drinking cup only as required by the fowls and no wastage of water occurs.

WHAT WE CLAIM IS:—

1. Apparatus for supplying water to fowls comprising a water supply line, a cup and a valve for controlling the flow of water from the line to the cup and a pivotally mounted operating lever responsive to pecking force to open the valve against the force exerted thereon by the pressure of water in the supply line, the lever being buoyant in water but sufficiently long to be operable to open the valve by very young fowls. 95
2. Apparatus according to claim 1, wherein the lever has a removable part enabling the lever to be shortened so as to require a greater pecking force to open the valve. 105
3. Apparatus according to claim 1, including a shorter lever and wherein the first mentioned lever is removable and replaceable by the shorter lever. 110
4. Apparatus according to claim 1, 2 or 3, comprising means for adjusting the water pressure. 115
5. Apparatus according to claim 4, wherein the pressure is adjustable from a low pressure at which the weight of the lever opens the valve when the water level in the cup falls, through a pressure at which a peck is required to open the valve which then stays open however because of the weight of the lever, until the water level rises sufficiently to close the valve, to a pressure at which the valve is only open when the lever is subjected to a pecking force. 120
6. Apparatus for supplying water to fowls substantially as described with reference to and as shown in Figs. 1 to 5 and Fig. 8 or Fig. 9 of the accompanying drawings. 125
7. Apparatus for supplying water to fowls

substantially as described with reference to
and as shown in Figs. 10 to 14 of the accom-
panying drawings.

REDDIE & GROSE,
Agents for the Applicants,
6, Bream's Buildings,
London, E.C.4.

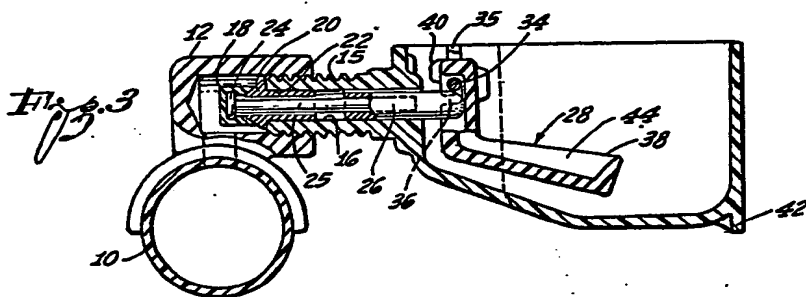
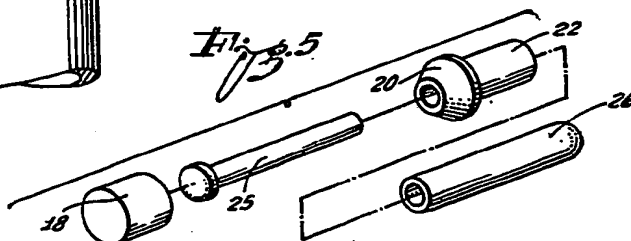
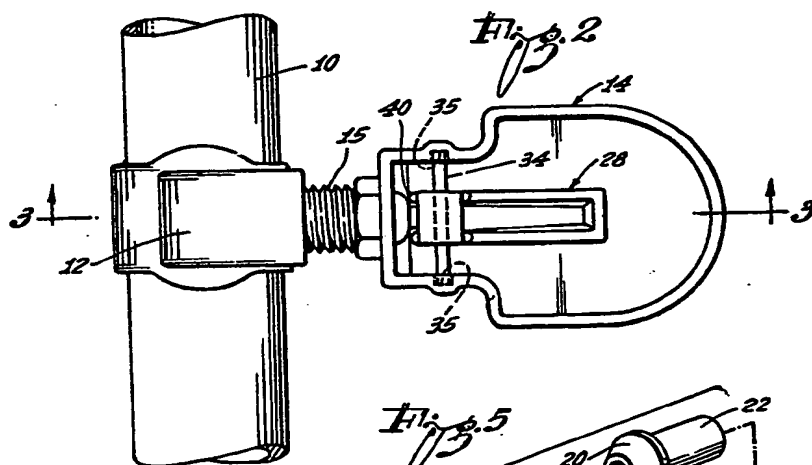
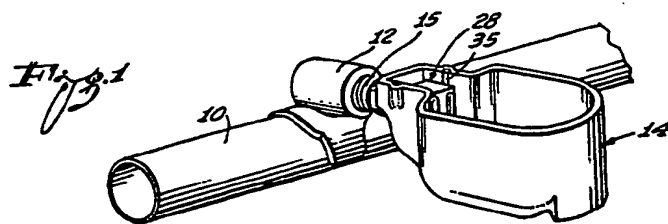
Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1968.
Published by the Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies may be obtained.

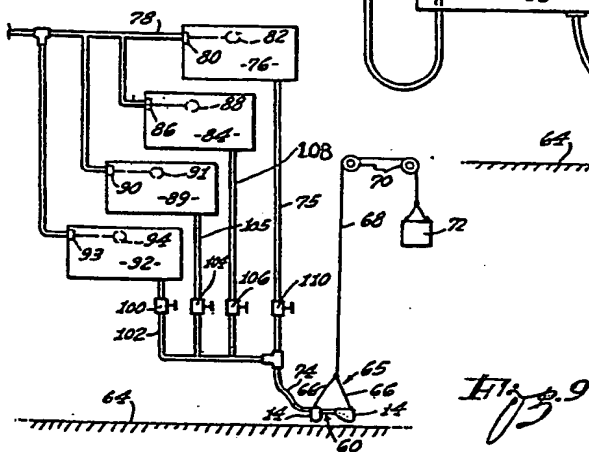
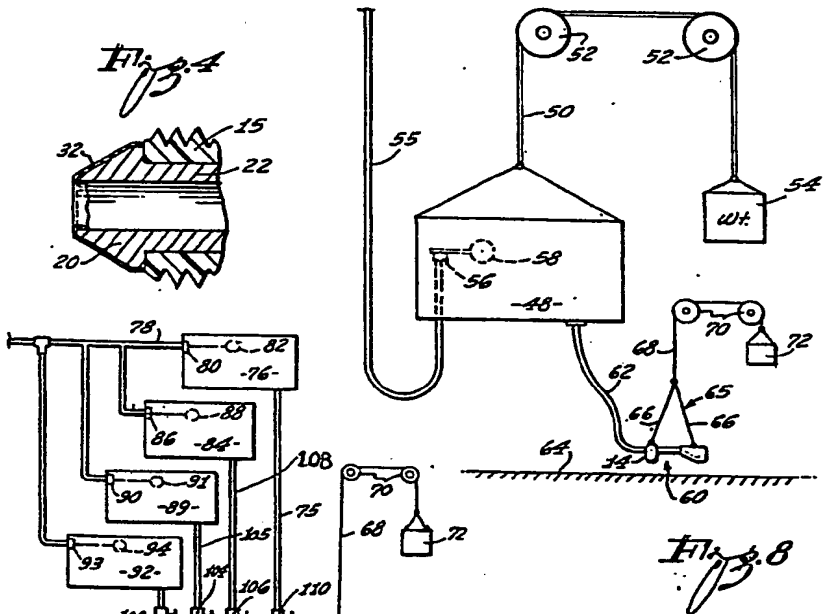
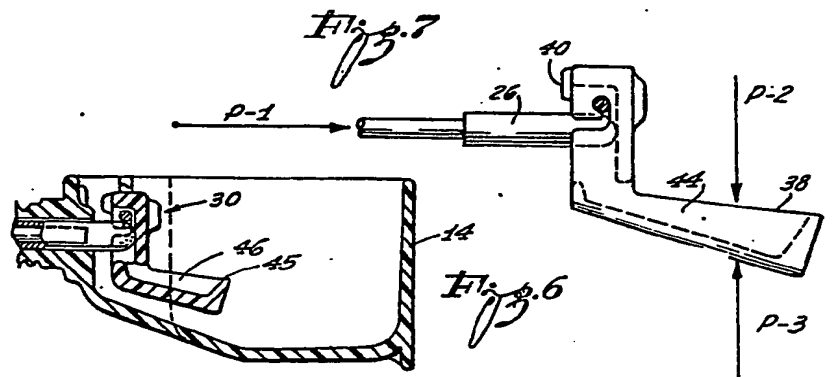
1102676

COMPLETE SPECIFICATION

3 SHEETS

This drawing is a reproduction of
the Original on a reduced scale
Sheet 1





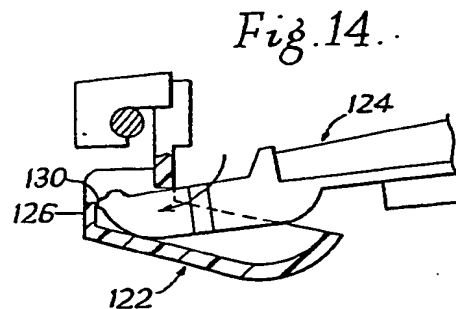
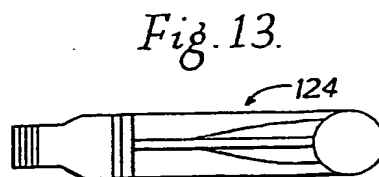
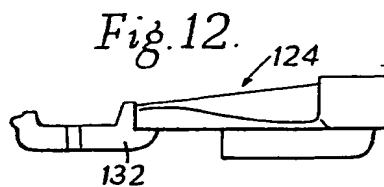
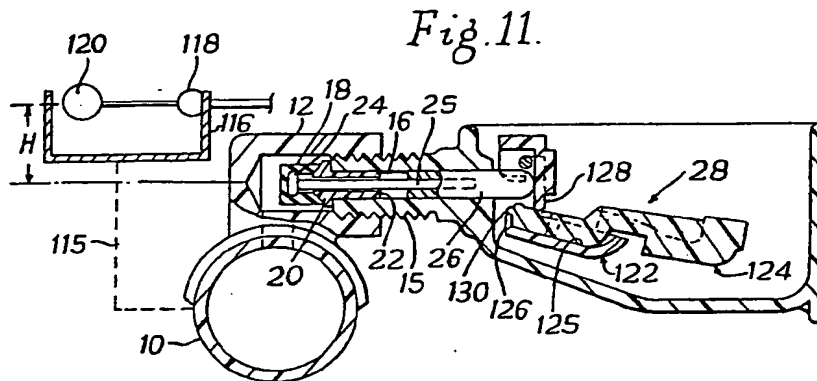
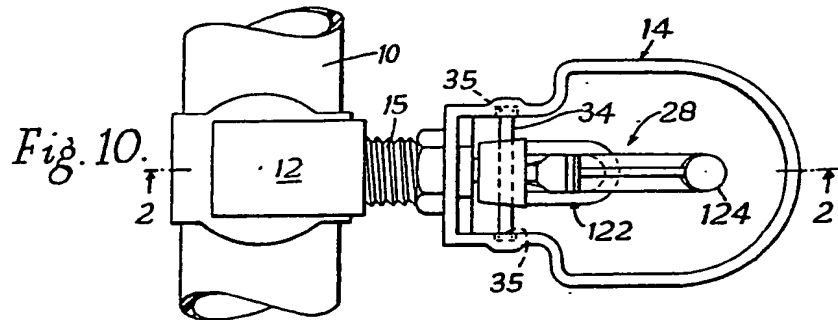
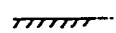
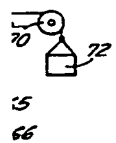
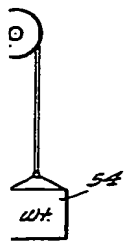
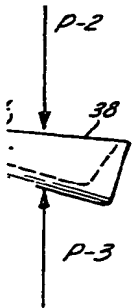
1102676

COMPLETE SPECIFICATION

3 SHEETS

This drawing is a reproduction of the Original on a reduced scale

Sheets 2 & 3



1102676 COMPLETE SPECIFICATION
This drawing is a reproduction of
3 SHEETS the Original on a reduced scale
Sheets 2 & 3

